

KEEP 2008

Summary Figures

KEEP DATA ANALYSES

DIABETES

Self-reported diabetes, self reported diabetic retinopathy, receiving medication for diabetes, or elevated blood glucose (WHO); fasting blood sugar ≥ 126 mg/dl, non-fasting blood sugar ≥ 200 mg/dl.

SELF-REPORTED DIABETES

Self-reported diabetes: self-reported diabetes, self-reported diabetic retinopathy.

HYPERTENSION

Self reported history hypertension, receiving a medication for hypertension, or elevated blood pressure (JNC7): Diabetes or CKD; systolic ≥ 130 mmHg or diastolic ≥ 80 mmHg, otherwise systolic ≥ 140 mmHg or diastolic ≥ 90 .

SELF-REPORTED HYPERTENSION

Self-reported hypertension

SELF-REPORTED CARDIOVASCULAR DISEASE

Participant reports any of the following cardiac events: heart attack, bypass surgery, heart

angioplasty, stroke, heart failure, abnormal heart rhythm, or PVD (only for KEEP version 2).

CHRONIC KIDNEY DISEASE

eGFR < 60 mL/min/1.73 m² or eGFR ≥ 60 mL/min/1.73 m² and albumin-creatinine ratio (ACR) ≥ 30 mg/g. GFR estimated using the IDMS-traceable 4-variable Modification of Diet in Renal Disease (MDRD) Study equation for calibrated serum creatinine (Scr) values: $GFR = 175 \times \text{standardized Scr}^{-1.154} \times \text{age}^{-0.203} \times 1.212$ [African Americans] $\times 0.742$ [women].

CKD STAGES

Stage 1: eGFR ≥ 90 mL/min/1.73 m², and ACR ≥ 30 mg/g
 Stage 2: eGFR 60–89 mL/min/1.73 m², and ACR ≥ 30 mg/g
 Stage 3: eGFR 30–59 mL/min/1.73 m²
 Stage 4: eGFR 15–29 mL/min/1.73 m²
 Stage 5: eGFR < 15 mL/min/1.73 m², or dialysis

ANEMIA**WHO**

Male: hemoglobin < 13 g/dl
 Female: < 12 g/dl

KDOQI (2006)

Males: hemoglobin < 13.5 g/dl
 Women < 12 g/dl

BODY MASS INDEX CATEGORIES

UW: underweight, BMI < 18.5
 N: normal, BMI 18.5–24.9
 OW: overweight, BMI 25–29.9
 OB: obese, BMI 30–39.9
 EOB: extremely obese, BMI ≥ 40

EDUCATIONAL STATUS

GSL: Grade school or less
 SHS: Some high school
 HSG: High school graduate
 SC+: Some college, college graduate, post-graduate

NHANES 1999–2006 DATA ANALYSES

SELF-REPORTED DIABETES

To be classified as having self-reported diabetes, participants had to report being told by a doctor, at any time, that they had diabetes or sugar diabetes other than that related to pregnancy. Participants answering “borderline” to the question were classified as non-diabetic

SELF-REPORTED HYPERTENSION

Self-reported hypertension was identified by an affirmative answer to the question: “Have you ever been told by a doctor that you had hypertension, also called high blood pressure.”

SELF-REPORTED CARDIOVASCULAR DISEASE

Participant reports any of the following cardiac events: coronary heart disease, angina/angina pectoris, heart attack, congestive heart failure, or stroke.

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eGFR < 60 mL/min/1.73 m² or eGFR ≥ 60 mL/min/1.73 m², and albumin-creatinine ratio (ACR) ≥ 30 mg/g. GFR estimated using the IDMS-traceable 4-variable Modification of Diet in Renal Disease (MDRD) Study equation for calibrated serum creatinine (Scr) values: $GFR = 175 \times \text{standardized Scr}^{-1.154} \times \text{age}^{-0.203} \times 1.212$ [African Americans] $\times 0.742$ [women].

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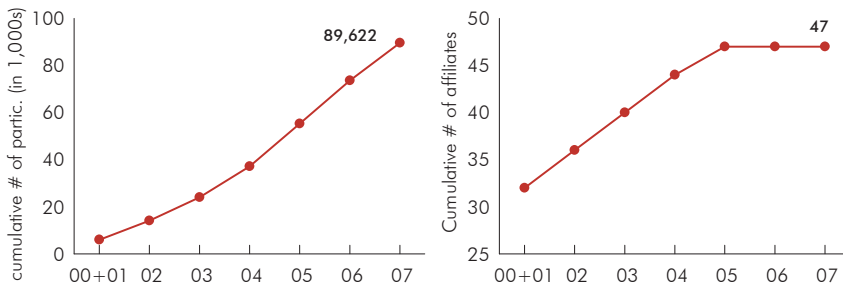
KDOQI (2006)

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EDUCATIONAL STATUS

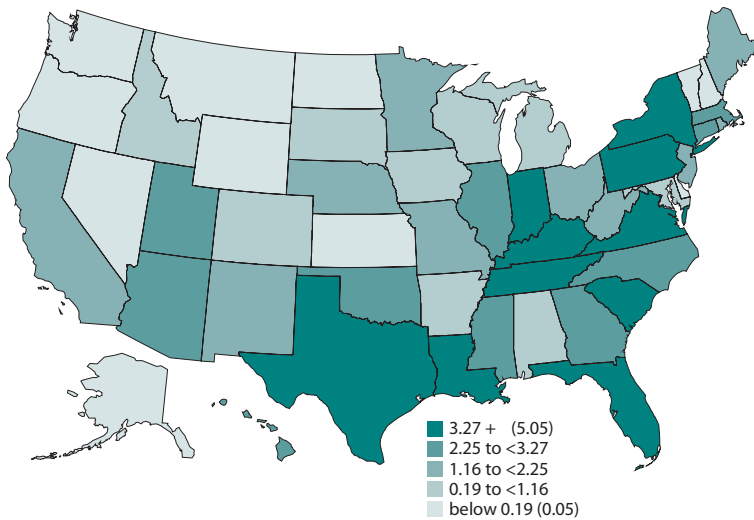


S.1

Cumulative number of eligible KEEP participants & affiliates, by year

KEEP N = 89,622.

In 2007, nearly 90,000 individuals participated in KEEP screening programs which were conducted by a total of 47 affiliates in 49 states and the District of Columbia.

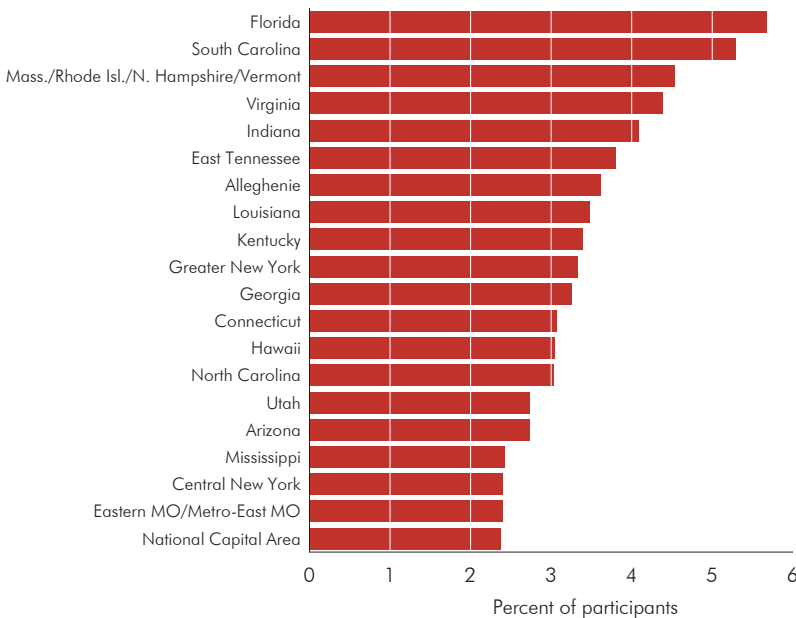


S.2

Geographic variations in the percentage of KEEP participants, by state

KEEP N = 89,622.

The highest rates of participation in the KEEP program occur in states located along the Gulf Coast, the Mid-Atlantic Region, the Ohio Valley, and portions of New England; participation rates average 5.05% for individuals residing in areas represented by the upper map quintile.



S.3

Top twenty (%) KEEP participants, by affiliate (rank order)

KEEP N = 89,622.

Florida continues to have the highest percentage of KEEP participants, at 5.7%, followed by the South Carolina and Mass./Rhode Isl./N. Hampshire/Vermont affiliates, at 5.3 and 4.5%, respectively.

s.a

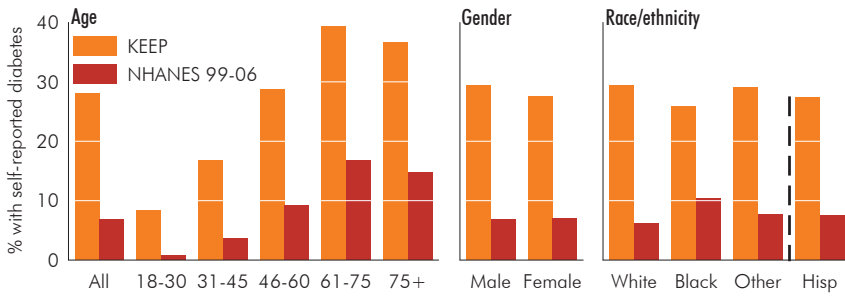
Total eligible KEEP participants

KEEP N = 89,622.

The greatest number of KEEP participants are between ages 46 and 75, female, and white. Approximately 7 times more non-Hispanics are screened compared to Hispanics, while the majority of participants have at least a high school diploma and some type of health insurance.

		2000+2001	2002	2003	2004	2005	2006	2007	All	All (%)
Age	18-30	568	644	1,004	1,085	1,391	1,257	989	6,938	7.7
	31-45	1,491	1,977	2,393	2,939	3,984	3,685	2,870	19,339	21.6
	46-60	2,097	2,651	3,422	4,690	6,437	6,592	5,509	31,398	35.0
	61-75	1,502	2,029	2,382	3,328	4,769	5,111	4,968	24,089	26.9
	>75	424	743	721	1,076	1,548	1,656	1,683	7,851	8.8
	Missing	.	.	.	5	2	.	.	7	0.0
Gender	Male	1,959	2,570	2,944	4,145	5,879	5,684	5,207	28,388	31.7
	Female	4,123	5,473	6,976	8,977	12,194	12,613	10,808	61,164	68.2
	Missing	.	1	2	1	58	4	4	70	0.1
Race	White	2,284	3,104	4,301	5,793	9,027	9,008	8,131	41,648	46.5
	Black	2,652	3,392	3,430	4,276	5,269	5,564	5,041	29,624	33.1
	Other	967	1,358	1,851	2,973	3,415	3,268	2,816	16,648	18.6
	Unknown/missing	179	190	340	81	420	461	31	1,702	1.9
Ethnicity	Hispanic	618	712	1,117	1,891	2,416	2,317	2,075	11,146	12.4
	Non-Hispanic	5,464	7,332	8,805	11,232	15,715	15,984	13,944	78,476	87.6
Education Level	≤ 6 years	362	406	499	814	1,051	1,019	888	5,039	5.6
	<12 years	586	871	921	1,188	1,780	1,763	1,581	8,690	9.7
	12 years	1,585	2,192	2,591	3,491	4,611	4,462	4,190	23,122	25.8
	>12 years	1,629	2,155	2,775	3,460	4,674	4,351	3,815	22,859	25.5
	16 years	1,143	1,463	1,913	2,531	3,616	3,815	3,228	17,709	19.8
	>16 years	688	862	1,132	1,469	2,144	2,452	2,019	10,766	12.0
Health Insurance Status	Yes	4,948	6,428	7,892	10,154	14,058	14,207	12,404	70,091	78.2
	No	883	1,234	1,660	2,494	3,251	3,371	3,292	16,185	18.1
	Missing	251	382	370	475	822	723	318	3,341	3.7
All		6,082	8,044	9,922	13,123	18,131	18,301	16,019	89,622	100.0

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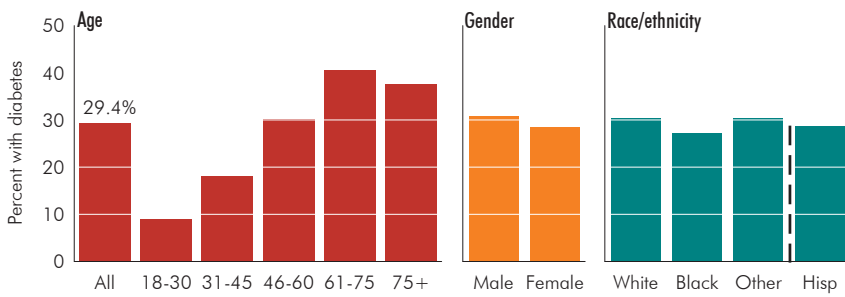


s.4

Self-reported diabetes in KEEP & NHANES participants

KEEP N= 88,812, age; 88,752, gender; 87,208 race; 88,818, ethnicity. NHANES N= 22,606.

Slightly over 28% of KEEP participants report that they have diabetes compared to 6.9% in the NHANES population. Diabetes is more prominent in older participants in both populations and evenly distributed among racial and ethnic groups.

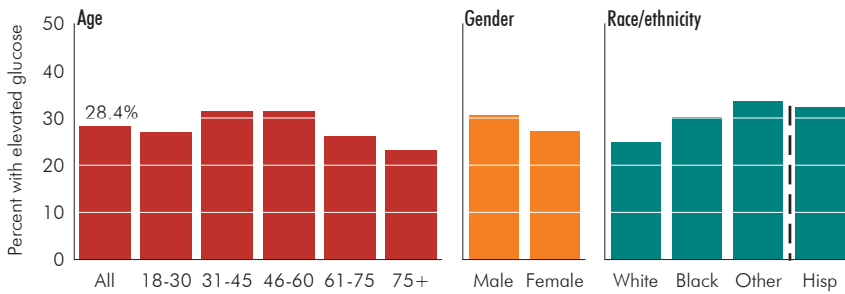


s.5

KEEP participants with diabetes

KEEP N= 89,598.

Diabetes is evident in 29.4% of KEEP participants and is identified in 40.6% of those age 61–75.

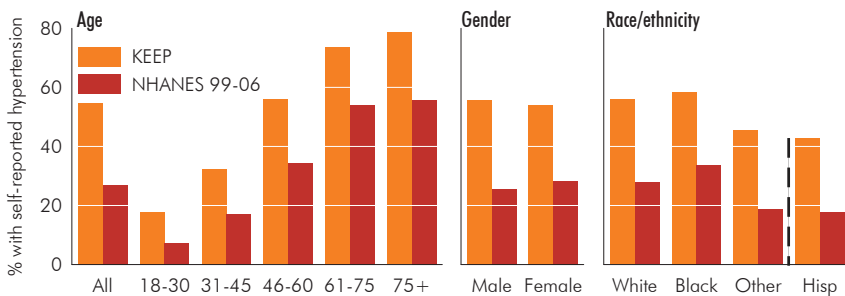


s.6

KEEP participants with diabetes who have elevated glucose levels

KEEP N= 26,307.

Close to 30% of KEEP participants with diabetes were found to have elevated glucose levels; elevated levels are more prominent in those age 31–60, males, and individuals of other races.

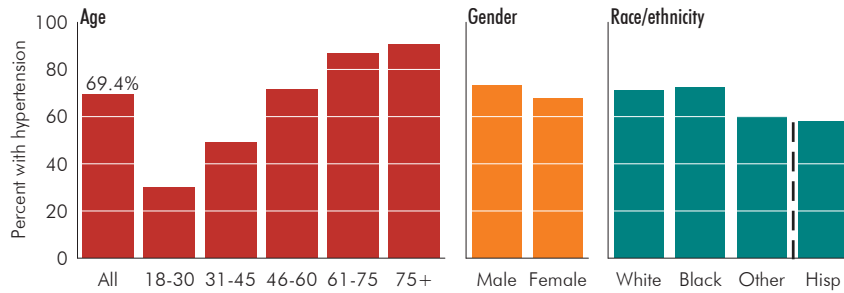


s.7

Self-reported hypertension in KEEP & NHANES participants

KEEP N= 88,183, age; 88,124, gender; 86,610 race; 88,190, ethnicity. NHANES N= 22,366.

Self-reported hypertension exist in 54.6% of KEEP participants and 26.9% of the NHANES population. Not surprisingly, rates of hypertension increase in both populations with age and are generally similar in whites and blacks.

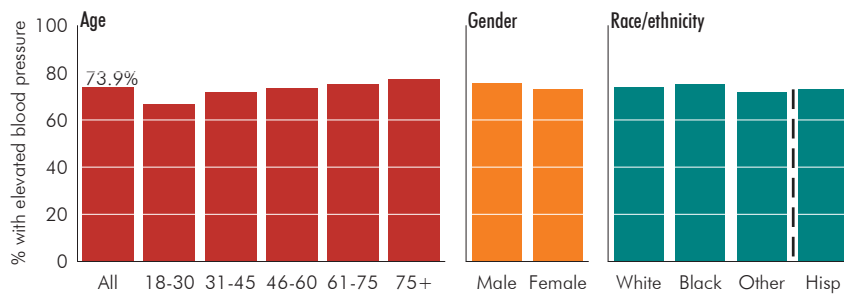


s.8

KEEP participants with hypertension

KEEP N= 89,607.

Hypertension exists in nearly 70% of KEEP participants, and the rate of hypertension increases with age.

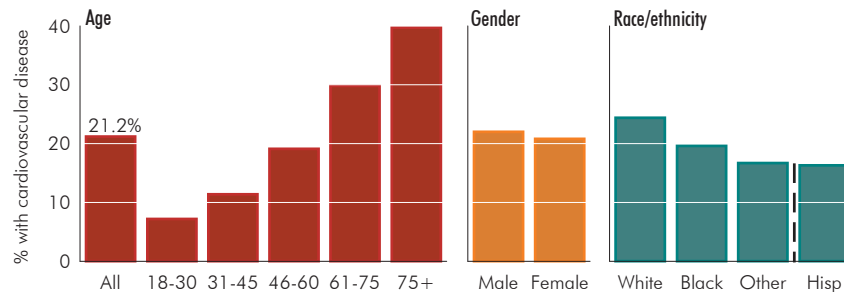


s.9

KEEP participants with hypertension who have an elevated blood pressure

KEEP N= 62,156.

Overall, nearly three in four KEEP participants with hypertension have an elevated blood pressure; rates vary only slightly across all age, gender, race, and ethnicity groups.

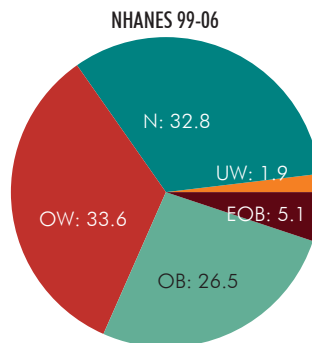
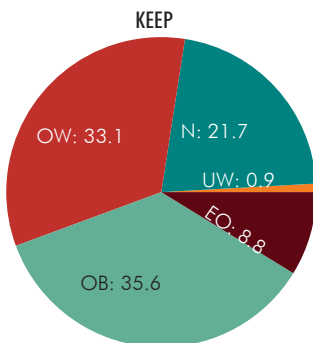


s.10

Self-reported cardiovascular disease in KEEP participants

KEEP N= 89,165, age; 89,552, gender; 87,920, race; 89,622, ethnicity.

Cardiovascular disease exists in one in five KEEP participants, and is most evident in those who are older, male, and white.



s.11

Percent distribution of KEEP & NHANES participants, by BMI

KEEP N= 88,003, NHANES N= 20,567.

One-third of KEEP and NHANES participants are considered to be overweight, while 35.6% of KEEP participants are obese compared to 26.5% in the NHANES population.

s.12

Prevalence of CKD in KEEP & NHANES participants

KEEP N= 77,073, age; 77,080, gender, race, & ethnicity. NHANES N= 19,551.

Overall, CKD is evident in 26.2% and 15.3%, respectively, of KEEP and NHANES participants. Of KEEP participants, 55.2% of those age 75 and older have CKD, compared to 60.4% in the NHANES population, while in KEEP, CKD is most prominent in whites.

s.13

Prevalence of CKD in KEEP & NHANES participants, by CKD stage

KEEP N= 77,080. NHANES= 19,551.

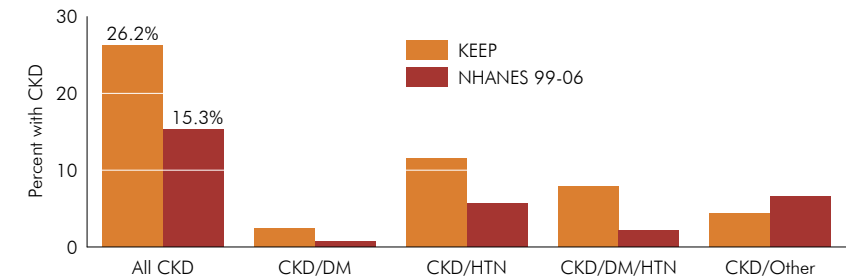
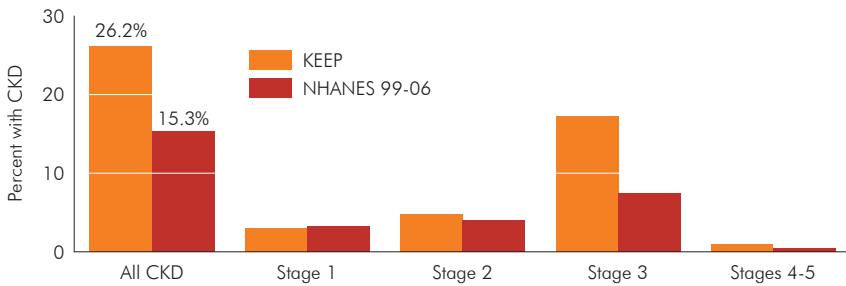
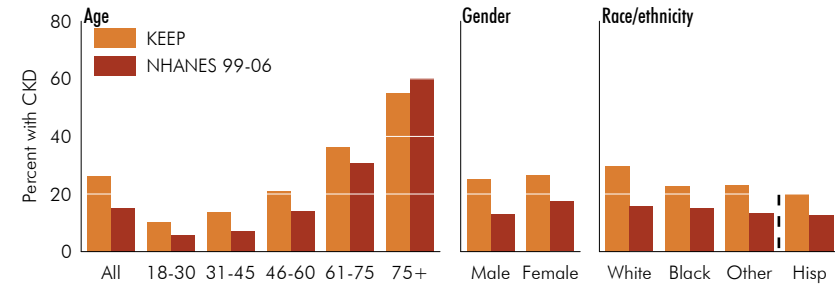
Stage 3 CKD (eGFR 30–59), is most apparent among KEEP participants for whom estimated glomerular filtration data are available, at 17.3%, with Stage 1 and Stage 2 accounting for 3.0 and 4.9% of participants, respectively.

s.14

Prevalence of CKD in KEEP & NHANES participants, by risk factor

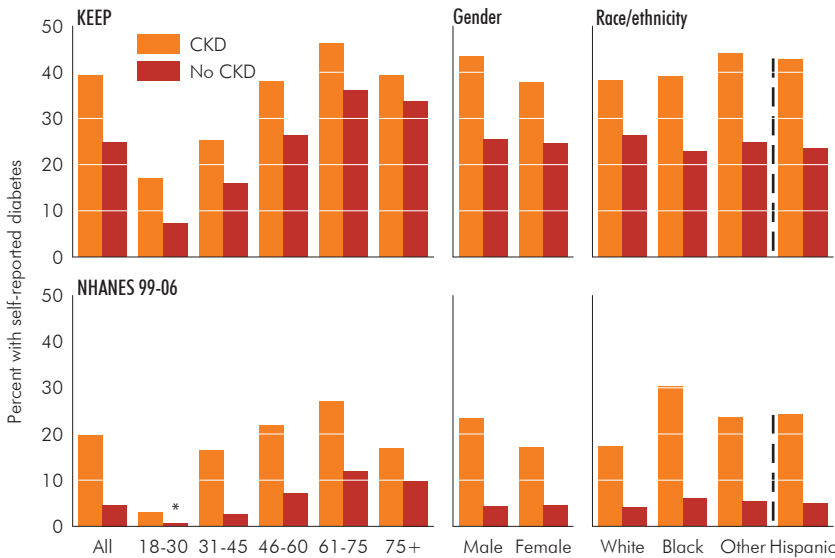
KEEP N= 76,527. NHANES N= 19,352.

Of KEEP participants with CKD, 11.5% have self-reported hypertension, 2.4% have self-reported diabetes, and nearly 8% are shown to have both risk factors; rates in NHANES participants, in contrast, are 5.7, 0.8, and 2.2%, respectively.



	Non-CKD	Stage 1 & Abnormal ACR	Stage 2 & Abnormal ACR	Stage 3	Stages 4-5	Missing	All
Age							
18-30	5,045	318	143	116	8	1,308	6,938
31-45	13,800	652	616	896	40	3,335	19,339
46-60	21,266	900	1,231	3,406	152	4,443	31,398
61-75	13,569	391	1,265	5,795	333	2,736	24,089
>75	3,196	66	497	3,114	258	720	7,851
Gender							
Male	18,169	658	1,297	3,877	293	4,094	28,388
Female	38,711	1,669	2,456	9,452	498	8,378	61,164
Missing	.	.	.	.	.	70	70
Race							
White	.	.	.	.	.	1,702	1,702
Black	26,421	674	1,722	8,343	429	4,059	41,648
Other	19,058	1,049	1,266	3,098	208	4,945	29,624
Unknown/missing	11,401	604	765	1,888	154	1,836	16,648
Ethnicity							
Hispanic	7,101	352	392	968	52	2,281	11,146
Non-Hispanic	49,779	1,975	3,361	12,361	739	10,261	78,476
U.S. Census Region							
Northeast	13,141	531	879	3,107	184	2,678	20,520
Midwest	8,902	378	602	2,102	137	1,726	13,847
South	27,980	1,143	1,817	6,386	352	6,650	44,328
West	6,842	275	455	1,728	118	1,477	10,895
Missing	15	.	.	6	.	11	32
U.S. Census Division							
New England	4,438	153	304	1,287	53	1,537	7,772
Middle Atlantic	8,703	378	575	1,820	131	1,141	12,748
East North Central	5,640	250	395	1,177	79	764	8,305
West North Central	3,262	128	207	925	58	962	5,542
South Atlantic	13,851	527	900	3,407	162	3,852	22,699
East South Central	7,904	292	505	1,717	92	1,170	11,680
West South Central	6,225	324	412	1,262	98	1,628	9,949
Mountain	4,164	167	253	1,171	64	827	6,646
Pacific	2,678	108	202	557	54	650	4,249
Missing	15	.	.	6	.	11	32
Smoking							
Yes	21,760	984	1,622	5,520	362	4,973	35,221
No	32,542	1,222	1,962	7,170	392	6,735	50,023
Missing	2,578	121	169	639	37	834	4,378
Education Level							
≤ 6 years	2,783	154	252	919	85	846	5,039
<12 years	4,999	274	435	1,537	109	1,336	8,690
12 years	14,093	651	986	3,954	253	3,185	23,122
>12 years	14,789	592	956	3,136	174	3,212	22,859
16 years	12,217	425	635	2,055	94	2,283	17,709
>16 years	7,227	198	409	1,520	67	1,345	10,766
Missing	772	33	80	208	9	335	1,437
Health Insurance Status							
Yes	43,996	1,573	2,949	11,352	675	9,546	70,091
No	10,953	657	666	1,445	80	2,384	16,185
Missing	1,931	97	138	532	36	612	3,346
Doctor Status							
Yes	47,417	1,883	3,273	12,236	733	10,300	75,842
No	8,199	382	397	776	36	1,792	11,582
Missing	1264	62	83	317	22	450	2,198
All	56,880	2,327	3,753	13,329	791	12,542	89,622

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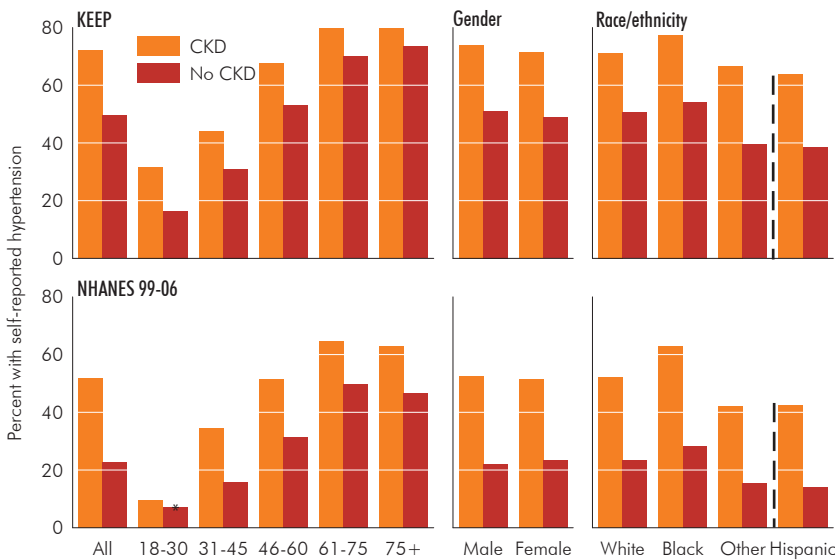
s.15

Self-reported diabetes in KEEP & NHANES participants with or without CKD

KEEP N= 19,960, CKD; 55,945, no CKD. NHANES N= 3,611, CKD; 15,929, no CKD.

In both the KEEP and NHANES populations, self-reported diabetes is more evident in those with CKD—at 39.5 and 19.7%, respectively—compared to 24.9 and 4.6% in those with no diagnosis for CKD. By gender, diabetes is 13–19% more common in male and females with CKD compared to those without the diagnosis. In white and black KEEP participants with CKD, 38–39% report having diabetes compared to 23–26% of those with no CKD who report the condition.

**estimate not reliable*



s.16

Self-reported hypertension in KEEP & NHANES participants with or without CKD

KEEP N= 19,963 CKD; 55,949 no CKD. NHANES N= 3,589 CKD; 15,769 no CKD.

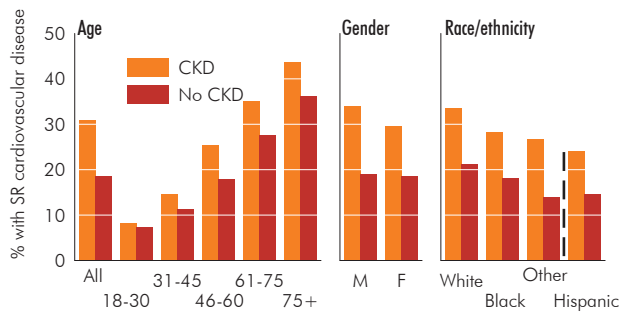
Among KEEP participants with or without CKD, 72.2 and 49.6%, respectively, report that they are hypertensive, while 52% of NHANES participants with CKD report being hypertensive compared to 22.6% of participants with no CKD. Nearly three of four male and female KEEP participants self-report hypertension compared to one in two participants with no CKD. In the NHANES population, 51–52% of male and female participants with CKD report being hypertensive compared to 22–23% of those with no CKD. Self-reported hypertension is evident in 71.2, 77.5, 66.8, and 63.7%, respectively, of whites, blacks, individuals of other races, and Hispanics with CKD, compared to 50.6, 54.2, 39.4, and 38.4% of participants with no CKD.

s.b (to the left)

Total eligible KEEP participants with CKD, by CKD stage

KEEP N= 86,622.

Of the total eligible KEEP participants with CKD, Stage 3 (eGFR 30–59) is most apparent; CKD exists in greater proportions of females, whites, and older age groups. Geographically, CKD is most prominent in the South U.S. census region; a high concentration of participants reside in the South Atlantic census division. More non-smokers than smokers have CKD, as do those with health insurance compared to those with no insurance.

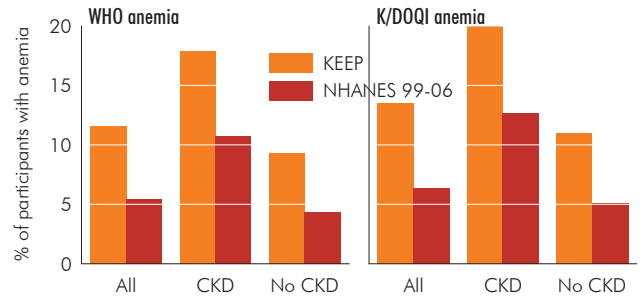


s.17

Self-reported cardiovascular disease in KEEP participants with or without CKD

KEEP N= 77,073, age: 77,080, gender, race, & ethnicity.

Cardiovascular disease (CVD) is present in 31% of KEEP participants with CKD compared to 18.7% of those with no CKD. Proportions of patients with CVD increase with age in both CKD and non-CKD participants, and CVD is most prominent in whites regardless of CKD status.

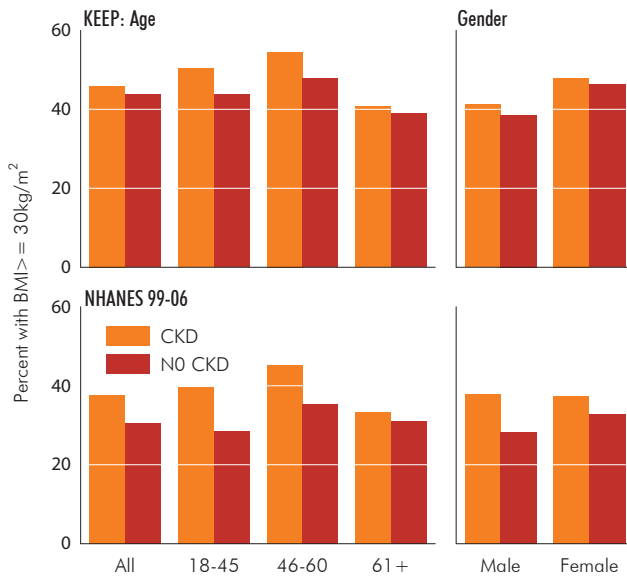


s.19

Anemia (WHO & KDOQI definitions) in KEEP & NHANES participants, by CKD status

KEEP N= 76,148. NHANES N= 19,531.

Using the WHO definition for anemia, 11.6% of all eligible KEEP participants are classified as anemic compared to 5.4% in the NHANES population. By the KDOQI definition, 13.5% of KEEP participants are classified as anemic compared to 6.4% in the NHANES population.

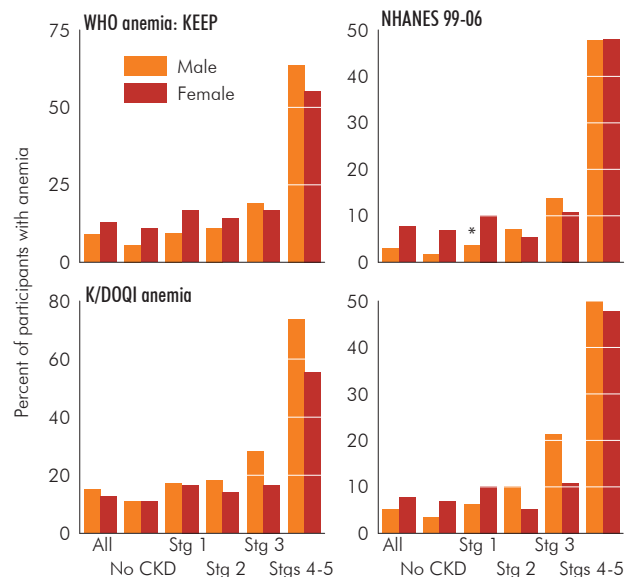


s.18

BMI ≥30 kg/m² in KEEP & NHANES participants with or without CKD

KEEP N= 75,733. NHANES N= 19,146.

The percent of KEEP participants classified as obese is similar in participants with or without CKD, at 45.9% and 43.8%, respectively; in the NHANES population, 37.7% of those with CKD are classified as obese compared to 30.6% of those without a CKD diagnosis.



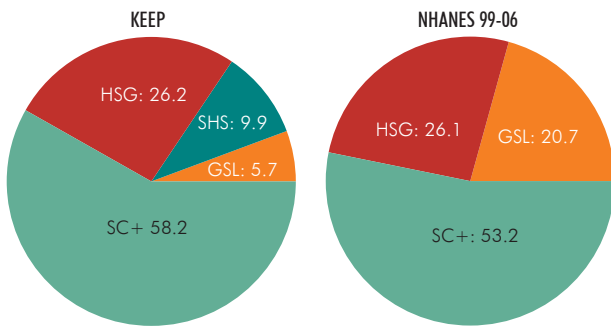
s.20

Anemia (WHO & KDOQI definitions) in KEEP & NHANES participants, by CKD stage & gender

KEEP N= 76,148. NHANES N= 19,531

Regardless of anemia definition (WHO or KDOQI), the condition becomes more apparent in both the KEEP and NHANES populations as the severity of CKD increases, and in the advanced stages of CKD is generally more evident in males than in females.

*estimate not reliable

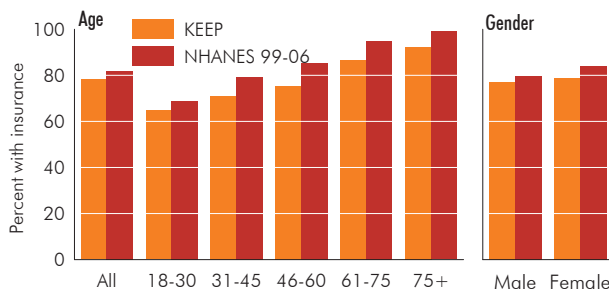


s.21

Percent distribution of KEEP & NHANES participants, by educational status

KEEP N= 88,185. NHANES N= 22,553

In the KEEP and NHANES populations, 26% of participants have completed high school and more than half—58.2 and 53.2%, respectively—have some level of college.

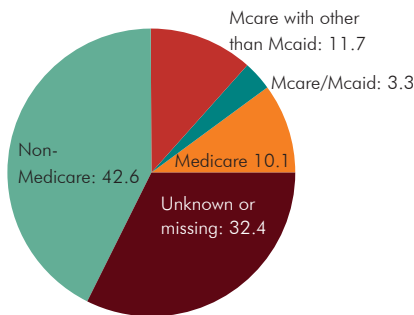


s.22

Insurance coverage in KEEP & NHANES participants, by age & gender

KEEP N= 70,089, age: 70,045 gender. NHANES N= 22,300.

Overall, 78.2 and 81.9% of KEEP and NHANES participants, respectively, have some type of insurance coverage. The proportions of participants with coverage increases with age, and is generally evenly distributed between males and females.

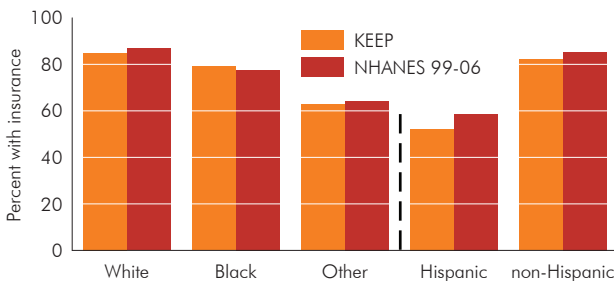


s.23

Percent distribution of types of insurance in KEEP participants reporting they have insurance

KEEP N= 89,622.

In KEEP participants reporting they have insurance, 10.1% are covered by Medicare, while 3.3% are dually covered by Medicare and Medicaid. The majority of participants (42.6%) have some type of coverage other than Medicare, while 11.7% have Medicare coverage with supplemental insurance provided by a carrier other than Medicaid.

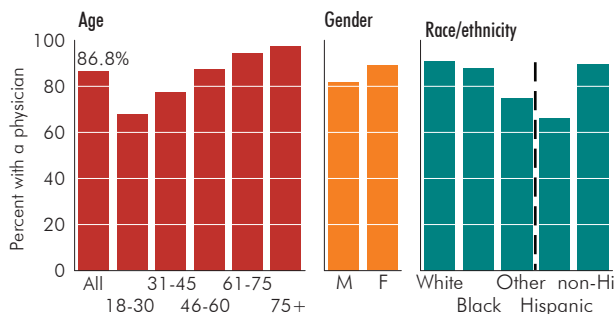


s.24

Insurance coverage in KEEP & NHANES participants, by race & ethnicity

KEEP N= 87,915, race; 89,617, ethnicity. NHANES N= 40,897

By race or ethnicity, 84.9, 79.0, 62.7, 52.2, and 82.1%, respectively, of whites, blacks, individuals of other races, Hispanics, and non-Hispanics participating in KEEP are insured; in the NHANES population, 86.8, 77.5, 64.4, 58.8, and 85.3%, respectively, have coverage.

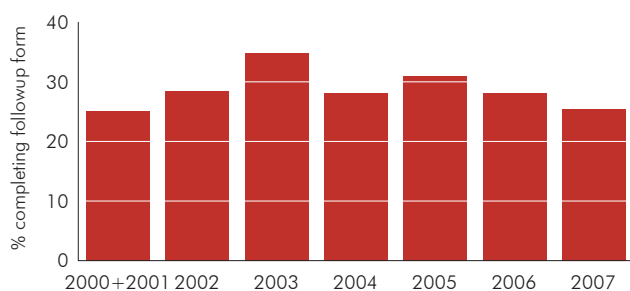


s.25

KEEP participants with a physician

KEEP N= 87,417, age; 87,359, gender; 85,856, race; 87,424, ethnicity.

Nearly 90% of all eligible KEEP participants have a physician. Slightly more females have physicians compared to males—89 versus 82%—and whites are more inclined to have a physician when compared to blacks and individuals of other races, at 91.2 and 87.9%, respectively.

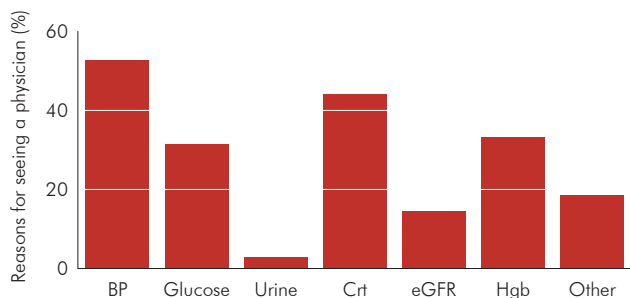


s.26

KEEP follow-up response rate (%)

Percent represents the number of participants who received follow-up forms divided by the number who returned the form & answered the question of seeing a doctor about screening results.

The percent of KEEP participants who returned follow-up forms peaked in 2003 with a response rate of 34.8%. The response rate has declined each year since 2005, reaching its lowest level since the combined year of 2000 and 2001, and now stands at 25.5%.



s.27

Reasons for seeing a physician in KEEP participants who return their follow-up forms

KEEP N= 18,323.

Among KEEP participants who returned their follow-up forms, the main reason for seeing a physician about test results was related to issues with blood pressure, at 52.8%, followed by abnormal results related to blood glucose, serum creatinine, or hemoglobin, at 31.6, 44.2, and 33.3%, respectively.

Table s.1

In 2007, nearly 90,000 individuals participated in KEEP screening programs, these programs were conducted by 47 affiliates nationwide.

Figure s.5

Diabetes is evident in 29.4% of KEEP participants and is identified in 40.6% of those age 61–75.

Figure s.8

Hypertension exists in nearly 70% of KEEP participants, and the rate of hypertension increases with age.

Figure s.12

Overall, CKD is evident in 26.2% and 15.3%, respectively, of KEEP and NHANES participants.

Figure s.13

Stage 3 CKD (eGFR 30–59), is most apparent among KEEP participants for whom estimated glomerular filtration data are available, at 17.3%, with Stage 1 and Stage 2 accounting for 3.0 and 4.9% of participants, respectively.

Table s.b

CKD exists in greater proportions of females, whites, and non-Hispanics. Geographically, CKD is most prominent in the South U.S. census region; a high concentration of participants reside in the South

Atlantic census division.

Figure s.15

In both the KEEP and NHANES populations, self-reported diabetes is more evident in those with CKD—at 39.5 and 19.7% respectively—compared to 2.4.9 and 4.6% in those with no diagnosis for CKD.

Figure s.16

Among KEEP participants with or without CKD, 72.2 and 49.6% report that they are hypertensive, while 52% of NHANES participants with CKD report this condition compared to 22.6% of those without CKD who report the diagnosis.

Figure s.17

Self-reported cardiovascular disease (CVD) is present in 31% of KEEP participants with CKD compared to 18.7% in participants with no CKD. Proportions of patients with CVD increase with age in both CKD and non-CKD participants, and CVD is most prominent in whites regardless of CKD status.

Figure s.26

The percent of KEEP participants who returned follow-up forms peaked in 2003 with a response rate of 34.8%. Since 2005, the response rate has declined each year, reaching its lowest level since the combined year of 2000 and 2001; it now stands at 25.5%.